Massachusetts Department of Public Health
Division of Epidemiology and Immunization

CONTROL OF INFLUENZA AND PNEUMOCOCCAL DISEASE IN LONG TERM CARE FACILITIES

2005 - 2006

The Massachusetts Department of Public Health (MDPH) encourages long-term care (LTC) facilities to protect residents and staff against influenza. In addition, vaccination to protect against pneumococcal disease is indicated for all LTC residents. Influenza and pneumococcal disease are major causes of morbidity and mortality, particularly among persons ≥ 65 years of age and people with underlying medical conditions. Vaccination against both influenza and pneumococcal disease is the most effective tool available for preventing pneumonia in LTC facilities. Vaccination rates in LTC facilities, however, have leveled off over the last few years and many LTC residents and staff in Massachusetts remain unimmunized. During the 2004 - 2005 influenza season, the MDPH Immunization Program investigated 31 outbreaks of influenza-like illness in LTC facilities, compared with 62 outbreaks during the previous flu season.

PREVENTION AND CONTROL MEASURES

Strategies for the prevention and control of influenza in long-term care facilities include:

- Annual influenza vaccination of all residents, employees and volunteers
- Pneumococcal vaccination of all residents
- Active surveillance, with influenza testing, for new illness cases
- Respiratory hygiene/cough etiquette programs
- Implementation of standard precautions and droplet precautions, as indicated
- Administration of prophylactic antiviral medications
- Restriction of ill visitors and personnel

I. PREVENTION MEASURES

A. Vaccination

1. Vaccination of Residents

A systematic approach to vaccination, with checklists, can increase immunization levels by 30 - 40 percentage points. Facilities should review their immunization policies every year. Annual influenza vaccination for all residents and staff and PPV23 and Td vaccination should be part of the written immunization policy.

Consider residents with uncertain immunization histories
NOT immunized and vaccinate accordingly.
The benefits of vaccination far outweigh any concerns about revaccination.

Written immunization policies for long-term care facilities should include the following:

Vaccination as a Standard Part of Admission – Integrating vaccination into the admission process addresses vaccination for every resident in a routine, systematic manner.

Vaccine Information Statements (VIS) and Consent – VISs for pneumococcal, Td and influenza vaccines should be part of the admission packet. Consent for vaccination should be obtained from the resident or a family member at the time of admission. VISs in English and other languages are available online at www.immunize.org/vis and from MDPH.

Standing Orders – Standing orders should be in effect for all residents for administration of the 3 vaccines listed below. Standing orders are the most effective institution-based strategy for improving vaccination rates. Model standing orders are available from MDPH for:

- **Influenza vaccine** should be given to all residents and all staff every influenza season. Residents should be vaccinated in October. Residents admitted from October through March should be vaccinated on admission.

  In New England, flu season usually does not begin until December and peak until February. Influenza vaccine can and should be administered throughout the flu season.

- **Pneumococcal polysaccharide vaccine (PPV23)** should be given on admission to all unvaccinated residents ≥ 2 years of age. Previously vaccinated residents who are ≥ 65 years of age should receive a second dose of PPV23 if:

  a) It has been more than 5 years since their first dose; and

  b) They were younger than 65 years of age when they received the first dose.

  Local reactions at the injection site are reported following both first vaccination and revaccination with PPV23. These reactions are self-limiting and are not a contraindication to vaccination.

  Streptococcus pneumoniae, the organism that causes pneumococcal disease, is the most common cause of nursing home-acquired pneumonia. The case fatality rate is 5-7% and may be much higher in elderly persons. Pneumonia is the primary reason LTC residents require hospitalization. Increasing antimicrobial resistance complicates treatment of pneumococcal disease. PPV23 protects against pneumococcal meningitis and bacteremic pneumococcal pneumonia, a common complication of influenza.

- **Td vaccine** should be given on admission to all residents who are without immunization records, and to those for whom it has been ≥ 10 years since their last dose.

  Fewer than 50% of people ≥ 20 years of age in the United States are protected against both tetanus and diphtheria because they are not up to date with their Td. More than 50% of all tetanus cases in the U.S. are in people ≥ 60 years of age, and one fourth of these are associated with chronic wounds, such as decubiti.

Simultaneous Administration – Influenza, PPV23 and Td vaccines are safe and effective when administered simultaneously in separate syringes at different anatomical sites.

Quality Assurance – Chart audits should ensure that there is documentation in every chart that the resident has been offered PPV23 and Td vaccines and annual influenza vaccine.

2. Vaccination of Employees

Studies have shown that 25% of all health care workers are infected with influenza every flu season. Influenza vaccination of all staff in LTC facilities reduces mortality in elderly patients. Influenza is often introduced into and spread throughout a facility by either staff or family members of residents. Influenza vaccine may be less effective in the very elderly and, although immunized, some LTC residents may remain susceptible to influenza. It is therefore important to reduce their exposure to the disease. Influenza vaccination of health care workers in nursing homes significantly reduces the impact of influenza among residents, as well as reducing absenteeism due to illness. All staff, including housekeeping and dietary staff, consultants and volunteers in LTC facilities should receive flu vaccine every year. Currently, only 29% of LTC employees in Massachusetts receive annual influenza vaccination.

Healthy health care workers < 50 years of age should be encouraged to receive live attenuated influenza vaccine (FluMist®), especially if inactivated influenza vaccine is in short supply. Inactivated influenza vaccine is preferred for vaccinating health care personnel who are ≥ 50 years old, have medical conditions that put them at risk for complications from influenza, and health care personnel of any age who have close contact with patients so immunocompromised that they require a special protective environment.

Note: Pneumococcal vaccine should also be used to vaccinate employees and volunteers who themselves have medical conditions that put them at risk for pneumococcal disease (chronic cardiac or pulmonary disease, diabetes, etc.) or who are ≥ 65 years of age.

- For strategies to improve influenza vaccination rates among health care workers in your facility go to http://www.nfid.org/publications/hcwmonograph.pdf.
- To obtain an Employee Immunization Toolkit, call MassPRO at 781-419-2749, or visit the Massachusetts Medical Society website at http://www.masspro.org/healthpro/hcqip/outpatient/immunizations.htm.

3. Vaccination of Family Members and Visitors

Family members of residents and other visitors should be informed about their role in the transmission of influenza to patients and they should be encouraged to receive influenza vaccine.

To find out where to get their flu shots, family members can call their health care provider or local board of health, visit the MassPRO web site at http://flu.masspro.org for a list of public flu vaccination clinics by city and town, or call the Massachusetts Department of Public Health at 617-983-6800.

B. Availability of State-Supplied Influenza Vaccine

Long-term care facilities are a top priority for receipt of state-supplied influenza vaccine. MDPH expects to provide sufficient state-supplied inactivated flu vaccine for all residents of long-term care facilities by November 2005. If there is state-supplied flu vaccine available after all residents have been vaccinated, state-supplied vaccine can be used to vaccinate employees.

Flu vaccine for employees may be available for purchase from the manufacturers below.

sanofi pasteur	800-822-2463	Inactivated influenza vaccine (for people ≥ 6 months of age)
Chiron*	800-244-7668	Inactivated influenza vaccine (for people ≥ 4 years of age)
GlaxoSmithKline	866-475-8222	Inactivated influenza vaccine (for people ≥ 18 years of age)
MedImmune	877-358-6478	Live, attenuated vaccine (for healthy people 5 - 49 years of age)

*Awaiting final FDA approval, as off 9/20/05

Vaccine wastage: Lost, wasted and unused doses of state-supplied influenza vaccine at LTC facilities cost thousands of dollars and threaten the viability of the MDPH adult vaccine program. In order to reduce the amount of wasted and unused vaccine, LTC facilities should return unused vaccine to the MDPH Regional Offices as soon as possible for redistribution.

C. Pneumococcal Polysaccharide Vaccine (PPV23) and Tetanus/diphtheria (Td) Vaccine

MDPH provides Td and PPV23 for all Massachusetts residents for whom these vaccines are recommended, including all residents of LTC facilities and those employees with medical conditions that put them at risk for pneumococcal disease. To order state-supplied PPV23 or Td, contact your local vaccine distributor or the MDPH Regional Office (see enclosed list).

II. INFECTION CONTROL MEASURES

The outbreak control measures described below should be promptly implemented in the event of any one of the following:

- Influenza is confirmed by laboratory testing in at least one resident
- More than one resident in the facility or an area of the facility (e.g., separate unit) develops influenza-like illness (ILI) during a 1-week period.

ILI is defined as fever ≥ 100° F with cough or sore throat, in the absence of a known cause.

A. Surveillance for Influenza at Your Facility

Facilities should establish a surveillance system to identify any increased incidence of ILI among patients. Educate personnel about the signs and symptoms of influenza and indications for obtaining influenza testing. Other symptoms may include myalgia, headache or weakness. A cluster is defined as three or more cases of ILI occurring within 48 to 72 hours, in residents who are in close proximity to each other (e.g., in the same area of the facility). **An outbreak is defined as a sudden increase of ILI cases over the normal background rate. However, one case of influenza confirmed by any laboratory testing method in a LTC facility resident is also considered an outbreak.**

It is important to collect information about the location (wing, floor, unit, room); group activities; immunization history; predisposing factors; dates of onset; symptoms; complications (including pneumonia, hospitalization and death); pertinent diagnostic tests (including cultures, rapid tests, other laboratory tests and x-rays); and any antibiotics/antiviral agents administered. These data will be important in the development

and targeting of your outbreak control strategy. An *Influenza-Like Illness (ILI) Line Listing* has been attached for systematic collection of data in the event of ILI among patients or staff. Implement daily active surveillance for respiratory illness among all residents and health care personnel until at least 1 week after the last confirmed influenza case occurred.

Any sudden increase in absenteeism or illness among staff also warrants an investigation. Remind employees to notify their employee health service if they are experiencing febrile respiratory symptoms and exclude them from direct patient care for 5 days following onset of symptoms, when possible.

B. Notification

An immunization epidemiologist at MDPH should be notified within 24 hours at 617-983-6800 or 888-658-2850 when:

- Influenza is diagnosed with laboratory confirmation in at least one resident, or
- Three or more cases of ILI occur within 48 to 72 hours, in residents who are in close proximity to each other (e.g., in the same area of the facility), or
- There is an outbreak (e.g., a sudden increase of ILI cases over the normal background rate and/or one case of influenza confirmed by any laboratory testing method in a LTC facility resident).

All outbreaks should also be reported to:

- The Division of Health Care Quality at 800-462-5540, ext. 8150 (Accident/Incident line) within 24 hours of outbreak recognition
- Your local board of health

In addition, advise all visitors and employees of influenza activity in the facility, through signage and other means. When transfers occur, notify the receiving facility of the influenza activity.

C. Specimen Testing

In addition to influenza surveillance, diagnostic testing for influenza can aid clinical judgment and guide treatment decisions. The accuracy of clinical diagnosis of influenza based on symptoms alone is limited because symptoms from illness caused by other pathogens (e.g., parainfluenza viruses, respiratory syncytial virus [RSV], adenovirus and *Mycoplasma pneumoniae* can overlap considerably with influenza. Diagnostic tests for influenza and RSV performed at the State Laboratory Institute (SLI) include viral culture and rapid antigen testing. For general information on influenza testing, visit the CDC website http://www.cdc.gov/flu/professionals/labdiagnosis.htm

- **Influenza, parainfluenza, adenovirus, RSV diagnostic testing:** Recovery of virus differs between throat and nasopharyngeal (NP) swab collection. It is recommended that NP swabs be used for all specimen collection because there is better recovery of virus and it allows testing for multiple agents (influenza, parainfluenza, adenovirus and RSV). RSV testing cannot be done from a throat swab. However, there may be instances where collecting a specimen with the NP swab is not feasible and, therefore, a throat swab is included in each kit. Only one swab should be taken. Please submit the Specimen Submission Form with the words "Respiratory Panel" written in Box #5 and contact the

MDPH immunization epidemiologist to arrange for specimen submission at 617-983-6800. Timely transport of specimens to SLI is of utmost importance, as specimens received more than 3 days after collection will be deemed unsuitable for testing.

- **Influenza virus isolation:** Kits for specimen collection can be ordered by calling MDPH at 617-983-6800. These kits include full instructions and throat and NP swabs. The kits should be kept frozen until used.

  Swab specimens for NP or throat cultures should be obtained $\leq$ 48 hours after symptom onset. No special technique other than that normally used for cultures is required to obtain a suitable specimen for an influenza culture. If you are using an NP swab please see the RSV section for collection and instructions. In the event of an outbreak, specimens should be obtained from 3 - 4 patients with the most recent onset of symptoms.

  Collect and send culture specimens, with a completed Specimen Submission Form (included), to the State Laboratory Institute (SLI) Virus Isolation Laboratory. Mail specimens as soon as possible, preferably on a Monday, Tuesday or Wednesday. If an influenza culture specimen is to be shipped on a Thursday or a Friday, please call an MDPH immunization epidemiologist at 617-983-6800 to arrange for submission via courier. Timely transport of specimens to SLI is of utmost importance, as specimens received more than 3 days after collection will be deemed unsuitable for testing.

- **Rapid detection by viral culture:** Rapid detection is helpful for making decisions about the use of antiviral agents. Upon receipt of a swab specimen, the SLI routinely uses a rapid viral culture technique. If influenza A or B is present, a presumptive diagnosis may be available within 24 - 48 hours. The SLI will notify the submitting facility if a presumptive positive diagnosis is made. A confirmatory diagnosis, using traditional culture methods, will follow the presumptive diagnosis and should be available 4 - 12 days after receipt of the clinical specimens.

- **Rapid antigen testing:** Rapid antigen testing is also available at some commercial laboratories and in some provider offices. These rapid tests differ in the types of influenza virus they can detect and whether or not they can distinguish between types A and B. Due to the lower sensitivity (i.e., false negatives) of the rapid tests, clinicians should consider confirming negative tests with viral culture or other means (i.e., PCR). Despite the availability of rapid antigen testing, the collection of clinical specimens for viral culture is critical, because only culture isolates can provide specific information on circulating influenza subtypes and strains. Package inserts and the laboratory performing the test should be consulted for more detail.

- **RSV isolation:** To optimize RSV isolation, an NP swab specimen (not a throat swab specimen) should be collected at the acute onset of illness or within 48 hours. Fever does not have to be present at the time of specimen collection. NP swabs (included in the kit) should be bent in to a gentle curve and inserted into the anterior nares and the posterior nasopharynx gently swabbed. Complete instructions for obtaining and transporting specimens are included in the kits. In the event of an outbreak, specimens should be obtained from 3 - 4 patients with the most recent onset of symptoms. Collect culture specimens and complete a Specimen Submission Form found in the kit and include with the specimen. RSV specimens must be returned to SLI the same day they are taken.

Please contact the MDPH immunization epidemiologist to arrange for specimen submission at 617-983-6800.

- ***Mycoplasma pneumoniae* testing:** SLI offers an IgM ELISA test on serum for *M. pneumoniae*. Serum specimens may be submitted at the same time as the throat and NP swabs for respiratory panel testing. The minimum amount of serum required for *M. pneumoniae* testing is 2 ml. Serum specimens should be obtained no later than one week after symptom onset. Serum should be collected in a serum-separator tube (SST); red-top tubes are also acceptable. A separate (second) Specimen Submission Form should be completed for *M. pneumoniae* testing with the words "*Mycoplasma pneumoniae*" written in box #5 for the test requested. Please note that hemolyzed, excessively lipaemic or microbially contaminated sera should not be used for testing as they may yield erroneous results.

D. Vaccination During an Outbreak

It is important to have a system in place to be able to readily identify unvaccinated residents and staff. Review the immunization status of patients and staff and immunize all unvaccinated residents and staff with influenza vaccine as soon as possible. Because pneumococcal disease is the most common complication of influenza, take this opportunity to immunize residents with pneumococcal (PPV23) vaccine as well.

E. Antiviral Agents

Antiviral drugs should not be used as a substitute for vaccination. Antiviral drugs, however, can be used as an adjunct to immunization for prophylaxis and control of influenza. Amantadine **and** rimantadine can be used for **both** the prophylaxis and treatment of influenza A only. Zanamivir is approved only for treatment, not prophylaxis, of influenza A and B. Oseltamivir is approved for treatment and prophylaxis of influenza A and B.

When antiviral agents are used for outbreak control, they should be administered to all residents (include all employees if variant strain is found that is not well matched to vaccine) regardless of immunization status. The drugs should be continued for 2 weeks after all residents and staff have been vaccinated and as long as one week after the last resident case occurred. The antiviral dose for each resident should be determined based on age, renal function, liver function and other pertinent characteristics. If there is a variant strain or unusual circumstances occurring during a season, MDPH will issue appropriate bulletins and advisories.

Pre-approved medication orders, or plans to obtain physician's orders on short notice, should be in place to ensure that chemoprophylaxis can be started as soon as possible.

For more information about the use of antiviral medications in the control of influenza, visit the CDC website on antivirals at: http://www.cdc.gov/flu/professionals/treatment/ and consult the package inserts.

F. Respiratory Hygiene/Cough Etiquette Programs

Respiratory hygiene/cough etiquette should be implemented whenever residents or visitors have symptoms of respiratory infection to prevent the transmission of respiratory infections

in LTC facilities. Tools to assist with promoting and implementing these recommendations are available at www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm.

- Post visual alerts instructing residents and persons who accompany them to inform health care personnel if they have symptoms of respiratory infection and discourage those who are ill from visiting the facility.
- Provide tissues or masks to residents and visitors who are coughing or sneezing so that they can cover their mouth and nose.
- Ensure that supplies for handwashing are available where sinks are located and provide dispensers of alcohol-based hand rubs in other locations. For materials to promote handwashing, visit http://www.mass.gov/dph/cdc/handwashing/hw.htm.
- Encourage persons who are coughing to sit ≥ 3 feet away from others, if possible. Discourage residents with respiratory symptoms from using common areas when feasible.

G. Standard Precautions (http://www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm)

During the care of any resident with symptoms of a respiratory infection, health care personnel should adhere to standard precautions:

- Wear gloves if hand contact with respiratory secretions or potentially contaminated surfaces is anticipated.
- Wear a gown if soiling of clothes with a resident's respiratory secretions is anticipated.
- Change gloves and gowns after each resident encounter and perform hand hygiene.
- Decontaminate hands before and after touching the resident, after touching the resident's environment, or after touching the resident's respiratory secretions, whether or not gloves are worn.
- When hands are visibly soiled or contaminated with respiratory secretions, wash hands with soap (either plain or antimicrobial) and water.
- If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands. Alternatively, wash hands with soap (either plain or antimicrobial) and water.

H. Droplet Precautions (http://www.cdc.gov/ncidod/hip/ISOLAT/droplet_prec_excerpt.htm)

In addition to standard precautions, health care workers should adhere to expanded droplet precautions during the care of a resident with suspected or confirmed influenza:

- Place resident into a private room. If a private room is not available, place (cohort) suspected influenza residents with other residents suspected of having influenza; cohort confirmed influenza residents with other residents confirmed to have influenza.
- Wear a surgical or procedure mask upon entering the resident's room or when working within 3 feet of the resident. Remove the mask when leaving the resident's room and dispose of the mask in a waste container.
- If resident movement or transport is necessary, have the resident wear a surgical or procedure mask, if possible.

I. Restrictions for Ill Visitors and Employees

If no or only sporadic influenza activity is in the surrounding community:

- Discourage persons with symptoms of a respiratory infection from visiting residents. Implement this measure through educational activities.
- Monitor health care personnel for symptoms of respiratory illness and consider removing those with symptoms from duties that involve direct resident contact. If excluded, they should not provide resident care for 5 days after the onset of symptoms.
- Monitor residents for symptoms of respiratory illness.

If widespread influenza activity is occurring in the surrounding community:

- Actively communicate to the public at large and visitors (e.g., via posted notices) that adults with respiratory symptoms should not visit the facility for 5 days and children with symptoms for 7 days following the onset of illness.
- Actively screen unvaccinated health care personnel for symptoms of respiratory infection and exclude those with symptoms for 5 days following the onset of symptoms.
- Monitor residents for symptoms of respiratory illness to determine need for precautions.

J. Other Considerations

In addition to standard and droplet precautions, consider implementing the following procedures:

- Limiting visitors and restricting new admissions
- To maintain the residents' ability to socialize and access to rehabilitation opportunities during periods when influenza infections are unlikely and no influenza is suspected or confirmed, residents with respiratory symptoms can be permitted to participate in group meals and activities if they can be placed greater than 3 feet from other residents and can perform respiratory hygiene/cough etiquette.
- If influenza is suspected in any resident, influenza testing should be done promptly. Confine symptomatic residents with suspected or confirmed influenza to their rooms or group them together in rooms or on one unit (i.e., cohorted) for 5 days following the onset of symptoms. Personnel should work on only one unit, if possible.
- Patients receiving antiviral treatment for influenza should continue to be confined until treatment is completed to prevent the spread of antiviral resistant influenza viruses.

Additional Information

CDC. Prevention and control of influenza: recommendations of the ACIP. MMWR 2005;54 (No. RR-8). http://www.cdc.gov/mmwr/preview/mmwrhtml/rr54e713a1.htm

CDC. Prevention of pneumococcal disease: recommendations of the ACIP. MMWR 1997;46 (No. RR-8). http://www.cdc.gov/mmwr/preview/mmwrhtml/00047135.htm

Vaccine Information Statements (VIS) in English and other languages: www.immunize.org/vis.

MDPH Flu Website: www.mass.gov/dph/flu

INFLUENZA-LIKE ILLNESS (ILI)
LINE LIST

Facility Name:_____

Date: _____

	Name	Patient (P) or Staff (S)	Age	Wing/ Unit	Flu Vax?	Pneumo Vax?	Date of Onset	Symptoms (check box)								CXR? Findings?	Hospitalized?	Died?	Flu Dx test and result	Other tests and results	Anti-viral?
								Fever (temp)	Cough	Sore throat	URI	Muscle Aches	Weakness	Vomiting	Diarrhea						
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